HOUSE OF COMMONS SESSION 1992–93

SCIENCE AND TECHNOLOGY COMMITTEE

THE ROUTES THROUGH WHICH THE SCIENCE BASE IS TRANSLATED INTO INNOVATIVE AND COMPETITIVE TECHNOLOGY

MINUTES OF EVIDENCE

Wednesday 3 November 1993

Dr J E Maund and Mr M Bright

Ordered by The House of Commons *to be printed*
3 November 1993

LONDON: HMSO
£4.20 net

654–ix

WEDNESDAY 3 NOVEMBER 1993

Members present:

Sir Giles Shaw, in the Chair

Mr Spencer Batiste
Dr Jeremy Bray
Mrs Anne Campbell
Mr William Powell
Sir Trevor Skeet
Sir Gerard Vaughan
Dr Alan W Williams

DR J E MAUND, Deputy Managing Director, Mazak Machine Tools, Yamazaki Machinery UK Ltd and MR M BRIGHT, Chairman, Flexible Manufacturing Technology, were examined.

Chairman

674. Gentlemen, you know the Committee's remit and the inquiry it is conducting and indeed you have submitted written information to us but we hoped that we might persuade you to come and have an oral session with us so that we can perhaps probe some of the issues. Obviously the questions may be related to each of your two companies or may be related to the industry in which you both participate but I hope it will be acceptable to you. There is a question which is in our minds which I would pose to both of you, if I may, on behalf of the Committee. Is it important for the United Kingdom to have its own machine tool industry or is it not? If it is important, why? If it is not important, why not? Who would like to answer that? Dr Maund?

(Dr Maund) Just a couple of observations. Yes, it is important. The machine tool industry is really the core to the manufacturing process, particularly in the metal cutting field. Without the use of machine tools one cannot manufacture. The question is Where should that machine tool come from? Certainly in the direction which modern technology is moving there is a greater integration between the machine tool and the product it produces. The closer that is to the use of the machine tool, ie the manufacturing industry, the greater the liaison and cooperation between those two, the more effective that becomes. If that is a domestic industry, as it would be in the United Kingdom, that of course is an advantage to the general manufacturing sector. The further away the source of that technology or product the more difficult it is to have a collaborative route towards improvement. I think it is essential that this county has a progressive and strong machine tool industry. In fact, if one looks world-wide those countries with the strongest manufacturing base, ie. Germany and Japan, also have the strongest machine tool industries. Those with a declining manufacturing base, namely ourselves and America, have a substantially weakened machine tool industry and machine tool base.

675. Mr Bright?

(Mr Bright) Yes, I agree with what Dr Maund has said but I think also you have to split it into two different parts. Firstly is it important to have a machine tool industry from the balance of payments point of view? Traditionally we were in surplus and that surplus has just about now equalised between imports and exports. Unfortunately the exports are not so much in high technology. They may be CNC machine tools, which are computer numerically controlled, but not necessarily the advanced type. So we may remain in balance for some years but the important part of that is to know that it is not necessarily in the high technology end and that could fade and if that fades then the balance of trade could be swung into a very negative situation. If you ignore the balance of trade aspect and move on to technology, in the Japanese economy machine tools have been key since 1974 and I have to go back in history to give my answer properly. I am not sure if you are aware of the quantum leap in technology in 1974 through to 1980 which the Japanese took great advantage of. Our policy makers and academics were not even aware of it until the early 1980s. This quantum leap in technology meant that the Japanese were able to harness both government incentives and their own initiative to bring though the latest technology and therefore make their mechanical engineering sector extremely competitive. They brought through the very latest technology machines and one of the questions, which I will try not and get into now is incentives and so when this thrust, that started in 1974, has now carried through to the late 1980s and early 1990s, the technological advance of the Japanese means that their mechanical engineering industry is very competitive off the back of this high technology. They are in the forefront and with an indigenous high technology industry they naturally feed their own mechanical engineering industry first. Their industry obtains the advantage of all of the latest innovations ahead of other countries and so it is extremely important for them to retain a very strong machine tool industry as it would be for any country that in the 20th and 21st centuries believes there will be any form of manufacturing.

Sir Trevor Skeet

676. Could I just follow this up? You may have seen an article in the *Financial Times* on the 2nd November which suggests that the two countries, that is Japan and Germany, have 47 per cent of the total global machine tool production. A large part of the balance will be with the United States of America. We in the United Kingdom can only have a very small part of the remaining section. Now is it absolutely essential that we should have a very big industry here because we can import quite a lot particularly if they are speciality machines.

The cost of printing and publishing these Minutes of Evidence is estimated by HMSO at £650.

[Sir Trevor Skeet *Contd]*

(Mr Bright) I obviously have not made my point particularly clear then in the first part of my response because that percentage is against a percentage of 46 per cent of the share of the world market by European machine tool industry and the whole point is that it is not necessarily a question of volume. The volume is relative to the cost and the reason that the Japanese are so strong is that they build the volume and therefore their cost base is that much lower and because their cost base is that much lower they have a discounting policy that enables them to reduce their prices to 20 per 30 per cent lower than Europe, and then there is also USA competition. So to get back to the point that you made Is it important? The importance can only be measured by whether you want a mechanical engineering sector in the United Kingdom and in Europe that is using the highest possible productive and efficient equipment. This will make that sector therefore formidable competitors in world markets. They will not achieve that position because the Japanese will not allow them access to the latest technology at the same rate that they allow access to the indigenous manufacturers. That not allowing has got nothing to do with anything other than supporting what Dr Maund said in the first place, you have to be very close to your market to make the first inroads in high technology equipment.

Dr Bray

677. You stress the importance of having the innovation available. The UK has had pioneering development in machine tools. Dr Nagai in Yamazaki reminded me that Theo Williamson produced his "system 24" in the UK as the first flexible manufacturing system I think in the world.

(Dr Maund) I am sure Dr Nagai reminded you of many things. I agree.

678. There was also the pre-production ordering system at that time which ensured innovations were actually put into operation in firms. What has gone wrong since that period?

(Dr Maund) Could I make one other point on the first one just as an aside, if I may. It is interesting to see that the Taiwanese and South Koreans are currently rapidly developing their machine tool industry alongside their manufacturing base so they think there is a very close correlation between the two. In fact, we now find that the Taiwanese in particular are quite effective competitors and their technology is not that far behind that which was able to be offered in Europe and they are much closer to Japan than we are and if they wished to import they could do so very easily. I think yours is a much broader question as to what has gone wrong with the British manufacturing industry. Yes, the basic elements of technology do exist in this country and have done so and continue to do so. I think the Japanese, in particular, the manufacturing base, mechanical engineering automated in certain key sectors wish to demonstrate that they can produce a product and work very closely with their own machine tool industry to take whatever innovation was available to them and use it as effectively as possible. In this country there was a great reluctance to take that step and use it in a cost-effective manner.

Mrs Campbell

679. I would like to come back to what I think Mr Bright was saying earlier about incentives. While we were in Japan we saw several areas where the Japanese Government are able to give incentives to Japanese industry such as the Japan Development Bank, for example, concerning finance. We saw a good deal on the registration and exploitation of patents obviously geared to exploiting those in Japan and with Japanese industry and a number of research projects with universities and collaborative pre-competitive research. I wonder if you feel that the incentives to industry in the UK can be compared with those in Japan and are there any key areas in which you feel the UK should do more?

(Mr Bright) I have to refer back again to the first part of the question that I answered and that is that since 1974 the incentives that have been offered to the mechanical engineering industry in Japan (and this is the whole spectrum of printing, electrical, whatever part of mechanical engineering industry makes things that are mechanical) have been tax and depreciation and in a partnership between the industry and government, and this refers back also to Dr Jeremy Bray's question to a certain extent. The incentives were aimed at the customer base, the mechanical engineering industries buying the very early CNC technology and the very early drives and of motors that link the computer numerical control together with the mechanical engineering parts. This became known as mechatronics and each year the Japanese Government and industry have reviewed what is the level of technology that is required for the next, shall we say, ten years, and in that particular year the tax and depreciation incentives have been aimed at those customers in the mechanical engineering areas who use that particular type of innovation. Therefore, this year the customer will be purchasing the element of technology that will make them highly efficient in three, four and five years' time and that technology is not available outside of Japan until those industries have become more competitive. If I can go back to Dr Jeremy Bray's point, I do not agree that it is an unwillingness on the part of UK manufacturers to absorb this technology. I believe that there has not been the focused approach by industry and government and academics. You still have it to a lesser extent now, but certainly during the late eighties universities and colleges were teaching very old technology. The curriculum in schools is only just being updated and as a chairman of the governors (because I do try to make a contribution in other areas than my own speciality) of a local school I see it happening and I see the chaos that the last three years have caused. I am very sad about it. If there had been an understanding between 1974 and the mid-eighties and onwards by the policy-makers and by the academics of the quantum leap in technology that had taken place, then I do not believe there would be the difficulties—and I emphasise this—in the mechanical engineering sector and if you see the performance of the mechanical engineering sector in the UK it is also mirrored by the machine tool industry. I hope I am not being too verbose, Chairman, but I do feel very strongly about some of these issues.

[**Mrs Campbell** *Contd*]

Chairman: We now very clearly understand your view on the matter.

Mr Batiste

680. I hear what you say about Japanese focus and you are obviously very aware of the perceptions from Japanese eyes of the difference between applied and fundamental research and I think we rather acquired the impression that basic research did not exist in the Japanese horizon, though that may have been partial. What struck us most of all was the ferocious competition of the internal Japanese market that was the impetus to the companies that succeeded and to a degree their success outside was the cream that came as a consequence of being very good in their internal market. That seems to be a rather different perspective as to why their industry succeeded. Would you not accept that?

(Dr Maund) Could I make an observation on that? I would agree with you as far as basic research is concerned and there is very little, in actual fact, spent on basic research in the industries I have been associated with in Japan. The level of activity in the universities is even lower than it is here. As for the domestic competition, I know you have been to Mazak in Japan. I do not know whether you went to Okuma and Mori seiki. They are our two big competitors. They are known in Japan as the three tigers and they will scratch one anothers' eyes out. Whatever either one does the other one will do or regard it as losing face and they compete like mad in any market sector.

681. So it was not what the government was doing in terms of incentives; it was internal competition that was driving them?

(Dr Maund) Yes, the terrible competition that exists. That goes right the way through the top ten companies and especially the three biggest ones.

682. I was very impressed by your parent company which seemed to have a market advantage in that they evolve the machines to solve a company's problems and that is why it is becoming so popular. Will you be able to maintain your ability to charge an above market price by doing such a thing?

(Dr Maund) I do not know whether Mr Bright would agree with us on that! He and I compete in the same marketplace!

(Mr Bright) Mr Chairman, if I may. He answered this joint question the last time and I was not able to. I will not interrupt but I will answer your question.

(Dr Maund) I think there is always a premium price to be paid for something which offers a competitive advantage. One tries to reap that whenever one can. If one starts to lose one's competitive advantage one starts to lose one's effectiveness and development in the machine tool industry is an expensive business.

Chairman

683. But high price and high added values tend to go together?

(Dr Maund) They must do in these industries because they are so cyclical and you must reap during the good years to survive the famine and these days the famines seem to come fairly frequently.

(Mr Bright) If I could just come back and say I have travelled every year to Japan since 1974 and we also purchase elements of machines from Japan and I see the competitive element over there. What you also have to remember is that they are only competing with each other. They do not import any more than about five per cent of their machine tool requirements and so it is a very competitive internal market.

684. That is exactly so.

(Mr Bright) On the second point, the Japanese have a significant cost advantage because of the volume that they produce and these are not necessarily bespoke customer tailor-made machines; they are the mass-produced variety. It is only in the last couple of years that they have become more bespoke-orientated and I must say that Mr Yamazaki taught me, because I have met him once a year for maybe 10 years, the discounting philosophy of Japanese industry and it is pretty significant.

Mr Batiste

685. Can I just come back on this. You talked about the advantage of large-scale production in terms of cost-effectiveness. What we heard in Germany and what seems to be in the papers nowadays is the real cost of the growing competitive edge that the Japanese have over European industry. The European industry has loaded itself with social costs which produce huge differentials between Germany and Japan. We saw a figure that Germany was 37 per cent social costs more than the Japanese and that is a massive advantage, is it not?

(Mr Bright) Mr Chairman, if it is of any help to the Committee I do have various slides. I sometimes make presentations to learned bodies to try to dispel some of the myths and those slides actually show the comparisons of costs. I would like Mr Maund to see them before I show them to you.

(Dr Maund) I am totally familiar with it!

Dr Williams

686. Can I very briefly go back to this question of incentives. You said Japan especially between 1974-1980 had very substantial incentives and you quoted tax and depreciation. Mr Bright, in papers you have sent to this Committee there is one letter particularly that refers to two-tier interest rates and selective assistance grants. What kind of incentives and what kind of tax advantages should there be for companies to invest in these innovations?

(Mr Bright) I can only say that I also have some charts, Mr Chairman, of the types of tax and depreciation allowances which are similar to our capital allowances. They were discontinued because they were being abused substantially but of course because of a

[**Dr Williams** *Contd*]

lack of understanding of why they were abused they were completely abolished instead of being focused on productive plant and equipment. They are focused similar to our own capital allowance programme but there is also an accelerated depreciation allowance. I cannot remember but I think you can write off a particularly sophisticated piece of plant that is highly efficient in about three years.

Chairman

687. We have actually got the charts that you are referring to, Mr Bright, in evidence supplied by the Asia Advisory Service dated February 1991.

(Mr Bright) This was supplied, I think, by the MTTA.

Chairman: Can we turn now to research and development. Sir Gerard Vaughan.

Sir Gerard Vaughan

688. I was going to ask you how much you are able in this country to tailor your machines to individual customers but if I have understood you correctly you have talked about the importance of having your customer near to the machine tool industry. You have talked about the advantages of volume production. You have also said just recently the Japanese have begun to be more flexible. We have had put to us already a comment on R&D that companies selling advanced machine tools are essentially in the business of providing solutions to their customers' manufacturing problems rather than just selling a standard product range. Now with all the comments you have made on this, going back to the start of the question, how flexible are we in this country and how much are you able to adapt to customers' needs here and also customers' needs from overseas?

(Dr Maund) I think quite significantly. Do not misunderstand it: in modern machine tools one effectively produces the core machine. The interface between the core machine and the function it is performing within the customer is very much customised. You might have a machine of which the base core machine is only 30 per cent of the total value of the product and the rest is customised—work handling and things of that nature. It is the interface that is engineered domestically.

689. It has been put to us that R&D figures in this country are under-estimates of what actually goes on and there is more research and more flexibility than we get in the figures.

(Dr Maund) In my own submission to this Committee I said I could not identify what we meant by R&D and actually quantify it. That is not a criticism of my own company. I have worked in the telecommunications and the automotive industries and in both industries we had great difficulty in defining what we meant by R&D expenditure. It is as long as a piece of string. The amount of effort that is put into the modern machine tool, its adaption and use is significant. If you classify that as R&D——To me R&D is something so far away from market that it is almost out of sight. Anything closer than that is application of engineering and things of that nature which I do not classify as R&D.

(Mr Bright) We have more bespoke sales and systems in the United Kingdom than our combined Japanese and American competitors and we have focused on two aspects really. There is the customisation that is necessary to put standard machine tools together and then I agree partially with Dr Maund, there is the R&D of the actual machine tools and I was very interested to hear somebody say that there is not R&D so much in Japan as applied development and in the machine tool industry it is applied development to the standard machine tool. For example, in my own company, which is very small now, we have spent about £2.5 million or 4.5 per cent of our combined turnover in the last three years on the development of individual machines and we do not quantify the amount that we spend on customised engineering because this is built into the overall price to the customer.

Mr Batiste

690. This is really a question for Yamazaki. There appears to be a transition in inward investment into the UK from Japan that starts with the relatively straight forward assembly of products produced from Japan, then there has been product development and then basic research beyond that. It seems from the evidence that both of you have given that the adaptation of the product to the local marketplace is actually a key ingredient for success. You have said in your evidence that you intended to create a product development capacity both in the UK and in the United States within the next couple of years. What I think the Committee would really like to appreciate is how far and how fundamental that is going to be as a research and development operation?

(Dr Maund) I have used the words "research and development" within my own definition of it as opposed to the Committee's. Product adaptation, product development, machine tools and cutting instrumentation are about 250 years old. What a modern one is is very much better and perhaps faster and differently controlled from the one that started the Industrial Revolution. Most product development is about evolution, taking note of developments and changes. The only quantum change that has taken place in the industry in the last 50 years was the introduction of electronic control in the 1960s, which Mike has referred to. Product development refers to the core machine—in automotive terminology—rubber up. We are in the process of doing that now. The demands of the European market are different from those of the American market, are different from those of the Japanese market and the customer base is different.

691. So you would find it necessary to be able to develop a fairly independent capacity to be able to adapt the basic product to your customer?

(Dr Maund) Yes, indeed. That is recognised certainly by our own company and I think most inward investment from the Japanese is doing that now. The concept of the world machine tool as much as the world car is but a figment of the planner's imagination and not

[**Mr Batiste** *Contd*]

of reality. It is absolutely necessary that we organically grow here just as much as the original corporation organically grew in Japan. You cannot do it right away. Most of it is gained from experience. You cannot ignore the past and you cannot start again, so you have to create a wealth and body of experience before you can start the innovative process.

Dr Williams

692. This question is to Mr Bright. In the returns from your company to our questionnaire, it makes pretty grim reading on the whole in that because of the recession—it goes back to the eighties—there has been a fall in employment and a substantial fall in turnover. Could you perhaps make a comment on the recession and the over-valued pound and the ERM? More essentially, what effects have the tough times that you have been through had on your research and development budget?

(Mr Bright) If I could just pick up on what John Maund has said, and I do feel this very strongly, he talks about an evolution in 50 years. The first machine tool actually was made in the United Kingdom in 1803 to make ships' pulley blocks for Portsmouth Dockyard because there was a very high requirement for pulley blocks at that time. Since 1803 there was an evolution through manual intervention in all machine tools through until this 1974/5 period, and then there was the quantum leap between 1975 and now in CNC and this is the main reason that the Japanese have forged so far ahead, that their policy-makers were perceptive enough to understand it and we were not. Getting back on to the recession, coming through until 1989 we were moving back in employment to about 500 people, and we had ploughed an enormous amount into product development, bringing through a range of new machines, and this is the reason in the late eighties that we were able to achieve such a large market penetration of bespoke installations because we had really caught up with the Japanese by about 1984/5. In 1989 we had a couple of partnerships going that would have made us a significant force in European industry. We were making good profits. We were putting a lot of money into product development. I remember it so well, it was May 1989 that interest rates went up to 15 per cent. By October 1989 our potential partners were saying, "You are really heading for difficulties." By December 1990 I had sacked two managing directors who refused to accept that there was going to be a recession. By mid-1990 I had started to drive down both my inventory and my workforce and we continued to spend on product development through until last year against quite heavy losses and we are now undertaking minimal product development until the end of the recession. Frankly, we are on a survival course at the moment and the indications are that there is not going to be an upturn in the mechanical engineering sector, and I emphasise the mechanical engineering sector because I do not really believe enough attention is paid to it. There is not going to be an upturn in the mechanical engineering sector during 1994 and, therefore, there is not going to be an upturn in machine tool requirements in 1994, so I must leave the lid on any significant expenditures on either manpower or on development. From 1980 through until 1986/7 I retrained the whole of my workforce through a complete retraining programme in mechatronics and it has been a great tragedy to me to then turf them out of the building one by one.

Chairman: I think we understand fully the pressures which have caused those policies to be drawn.

Mr Powell

693. I would like to turn to your relations and your experience with universities and the independent research institutes. I was very interested in the observation which one of you made some minutes ago that the universities were teaching engineering courses which were really of an out-of-date technology as against what is required today. I wonder whether you can (either or both of you) give us the benefit of your experience in relations with universities and the research institutes and how they have developed over the last few years?

(Dr Maund) I think in very very many instances, of course, the state of technology in an industry like ours is more advanced in the operating companies than it is within the teaching establishments. That is inevitable because of a greater level of investment taking place there and the equipment that universities have at their disposal is inferior to that which is normally available within industry, so one tends to get a time lag between them. In fact, my own company is plagued with students who come round and spend days with us as part of their second degree course. I personally regard a graduate as someone whose mind is capable of being trained. I believe the degree of core knowledge which they come to us with now is declining, in my view, but that is a personal view, and we spend an awful lot of time effectively adding to both the technician and graduate training within the company itself as regards philosophy. There are certain aspects of university work which are again obviously of great interest to us, some of it more in software rather than in the hardware field. In the hardware field there are very few of them that are really equipped to do very advanced work. I think it is very similar to Japan, in actual fact. There is no difference in the amount of time spent in Japanese universities.

Sir Gerard Vaughan

694. Do they have sufficient funding, do you think, for that kind of change? I am talking about universities.

(Dr Maund) I do not feel an expert at all on university funding, how a university chooses to spend its funds.

695. That is not quite the question I was asking. I just wondered whether you felt they were held back by lack of funds to do what you would like them to be doing?

(Dr Maund) I am quite sure they feel they are. Even if they had all the funds they wanted whether they are properly equipped and staffed to do it I do not really know. I think over a period of time there has been a substantial decline.

696. You do not ask them to do things and they say they do not have the money to do so?

[Sir Gerard Vaughan *Contd]*

(Dr Maund) We have just stopped asking in certain fields.

697. Are there patent problems that hold them or you back?

(Dr Maund) Personally I do not think so. Someone once described a patent as licence to go into a patent judge's court to argue. I think that is all a patent is; it is premature or delayed disclosure. I do not think patents in any way shape or form are a limitation. Mr Bright might disagree.

(Mr Bright) I, like Dr Maund, am not an expert on university funding. We have a relationship with Cambridge on artificial intelligence, which has slowed down in the last couple of years, which is using software for automatic diagnostic techniques. We have a relationship with Brighton University and training programmes and we also work very closely with AMTRI, the industry research association. My son also recently in the last three years obtained a degree in mechanical engineering and when I visited the universities and when I do visit the universities I get the impression that the equipment that they are using is well out-of-date. They are not as well equipped as one would expect in the 1990s. As chairman of a local school I have had a running battle against the educationalists who do not see up-to-date mechanical engineering products as being a current requirement and in fact in the design and technology national curriculum there is no emphasis on mechatronics and there is no emphasis on spending on things such as machine tools and I would say as a generalisation in universities that appears to be the case. Although I am not an expert on universities, in schools I do know it is the case they are actively discouraged from buying machine tools.

Dr Bray

698. Mr Bright said that the policy makers in Britain had not understood the quantum leap that has taken place in the technology of machine tools over the last 15 years but it is over 25 years since the Ministry of Technology had a Committee on Numerically Controlled Machine Tools under the chairmanship of Donald McCallum of Ferranti, Edinburgh and a full range of innovative schemes have been running more or less continuously since then with the interruption three or four years ago when support for innovation was suspended. Now it is not just the origination or the introduction of the techniques into industry and the use by the customer that seems to have been lacking in Britain, it is just that the whole thing has not occurred at a volume and pace that produces a really viable industry.

(Dr Maund) Yes, I would agree with that personally. There does not seem to be the will or the level of consciousness to make it happen. Perhaps the manufacturing industry in this country has not got the same status and attitude in the general public as it has in Germany or in Japan. People feel proud to belong to a manufacturing company in Japan or Germany. I am not quite sure they share the same pride and willingness to join it in this country now.

(Mr Bright) Mr Chairman, if I may just come in and say that I do believe this goes back to the policy makers. There has been a very steep decline in mechanical engineering over two decades. Small innovative schemes by a particular department or a particular individual are not going to rectify it. For example, there are significant welfare policies and there are significant education policies particularly in the last couple of years and the fact that they have been wrongly focused and wrongly directed—which is a personal opinion from a chairman of a school who has faced it—is irrelevant. There is not the policy making emphasis upon mechatronics or upon what is required from the policy makers for mechanical engineering, electrical engineering and electronic engineering combined. If there were the same emphasis upon this quantum leap, it is not a particular focus, it is the same attention being paid to a very very significant area of the country's GDP by policy makers who continually talk about welfare, who continually talk about education but do not talk about mechatronics. I am sorry but when people talk about ethos, Mr Chairman, in the United Kingdom, I believe we have a wonderful ethos if it is properly directed, as we see from the Japanese companies who set up in this country which I have a great admiration for except they do not do any research and development.

699. Can I ask you specifically about micro-mechatronics in which the components are produced not by machine but by nithography. The view was put to us in Japan it will not be the machine tool companies that develop this technology, it is more likely to be the electronic companies.

(Dr Maund) What do you mean by "micro-mechatronics"?

700. Tiny, tiny.

(Dr Maund) Nano-engineering.

701. Not quite that small.

(Dr Maund) I suppose the greatest centre of nano-engineering in the world is located at Cranfield under Dr MacKeon, who is of world-wide renown and a most respected man in Japan; they are always flocking over here to come and talk to him.

702. Precisely so but in this area it is not the machine tool companies; which are taking the lead, in Japan it is in the electronic companies. In Britain I am not quite sure who they will be.

(Dr Maund) No it is one of these gestation technologies. Perhaps in the next 10 years one will see it emerging in places one never thought one would see it.

Chairman

703. I think both of you have from time to time in your evidence in written form indicated the importance of not having the industry driven by research but customer-pulled by whatever the demand of manufacturers for product development happens to be. That is not a policy makers' thing; that is a question of whether manufacturers want to develop in certain forms a

[**Chairman** *Contd*]
competitive advantage by investing in more sophisticated products and those requiring more sophisticated equipment.

(Dr Maund) They can be nudged in that direction.

Chairman: I agree, they could be nudged.

Sir Gerard Vaughan

704. We are all concerned about the universities. Do they think the industry could do more about waking up the universities?

(Dr Maund) We do our best. Perhaps it is not good enough.

Chairman

705. It has not had the effect.

(Dr Maund) What do you want? All of our money? I personally spend a lot of time teaching in universities and bringing them to my own company to try and make them understand what we are doing and why we are doing it.

Chairman: I think the Committee is well aware from previous evidence on previous subjects about the question of the manufacturing ethos and the culture which has obviously declined to the point where there is no natural phenomenon known as "manufacturing technique". Let us turn to the educational and training position. Anne Campbell.

Mrs Campbell

706. I am wondering where to start actually because I think my question was actually answered in response to William Powell's question when he asked you about the contact with universities and the independent research associations. Now I think the way you interpreted William Powell's question was very much on the education and training side but there are of course two main ways in which technology is transferred from the universities and research institutions, one is transfer of people and the other is transfer of ideas. I do not feel we have actually explored the transfer of ideas properly. If we could go back to that rather than go back to the education and training again, which I have picked up you do not feel is adequate, but on the transfer of ideas do you do all your own research in-house or do you have liaison with the universities. You mentioned Cambridge I think Mr Bright which is my constituency and I am obviously interested in that. Do you have that transfer of ideas from universities and research institutions and do you feel that that is helpful?

(Mr Bright) On the artificial intelligence aspect it was a complete interchange of ideas and it was a particular project that was going to lead through to funding under EUREKA, the European project, but this did not actually transpire. Yes, that was extremely useful. I think working with AMTRI, the industry research association, on individual elements of technology—— They too have their own interfaces with the university and I cannot really comment on those. With Brighton it is more a question of going through various training aspects with students to increase their knowledge of industry but at the same time giving them a particular project. So, yes, there is an interchange of ideas there.

Chairman

707. Dr Maund, could I perhaps ask you this, how do you compare the position here in the UK with the skills base of that in Japan or the US? You have operations in all three.

(Dr Maund) Skills base in what sense?

708. In the sense of providing a sufficiently qualified person to come into the machine tools industry you represent and, therefore, a reservoir of talent for you to use.

(Dr Maund) If we look at all three levels, we never take anybody directly after secondary other than on an apprenticeship scheme when we will take people at 16, but they come in either from technical colleges after doing a BTEC or HND or something of that level or graduate level into us. There is an interesting comparison that we frequently make with our Japanese colleagues as to the level of skill with which the engineer from college comes into us as a graduate from college. In Japan he goes into our parent company. Our general Japanese opinion is that they are better educated here than what they would probably receive in Japan. It is not my opinion, it is their's. I have frequently talked to my chairman about this. The companies know this and they spend the first two years effectively adding to their training and the graduate expects it. As you know, the policy in Japan is to bring everybody in in March irrespective of what level of education you have had prior to entering the company. No recruitment takes place at any other time in the year. Everybody comes in at the same time and then they all undergo the same basic training in the company's products and its philosophy, etc, etc, and then one expects graduates to move ahead in their ability and attitudes faster than those that have not had a university education and they inevitably do. When they have become useful members of society they are very frequently horizontally moved, which is I think another excellent thing. You very rarely get the degree of specialisation that you get in an English company. Here you come in and enter as an engineer and you will stay an engineer until you draw your retirement pension if you are not careful. In Japan it would never happen. You might not finish up running the finance department but certainly anything short of that could be in marketing, in manufacturing, in production engineering, as a natural course of your development through the company and these would be sideways moves, not necessarily promotion.

709. That would be the company's policy to do it that way?

(Dr Maund) I think that is the Japanese industry policy.

710. The whole of industry?

(Dr Maund) The whole of industry and one which we have very readily adapted here in our transplants and I find that the English people accept it and they enjoy it enormously.

Dr Bray

711. That has always been the case in the British chemical industry.

(Dr Maund) Indeed. It was when I started in industry. It was a long time ago, unfortunately. All graduates entered as graduate apprentices. We all spent two years —even though I had a second degree—with the company learning things which I knew nothing at all about which was quite considerable.

Dr Williams

712. I asked Mr Bright earlier about the difficult times in the last ten years, but in your own case—you were established in 1986—is that growth in turnover and in trade based largely on exports?

(Dr Maund) Primarily exports, yes.

713. What is the secret of your success then despite the recession?

(Dr Maund) Two points on that. Let me take the recession first: no company throughout the world has not felt the current recession—and I do not know whether that was mentioned to you in Japan—but in the current state the demand on our Japanese factories is severly depressed. Touching on the point you raised earlier, the relative value of the pound and yen are such now that we are taking over in the United Kingdom a market that was previously served by our parent company. I find our manufacturing programme is going up and their's is going down.

Dr Bray

714. You are supplying to Japan?

(Dr Maund) With the Japanese based factories the domestic demand has dropped through the floor.

715. You are exporting to Japan?

(Dr Maund) Not to Japan. There is no demand in Japan at the moment.

Chairman

716. You are taking a share from your parent companies.

(Dr Maund) Domestic share in the Japanese market is currently running at 45 per cent. of the 1990 level. Export demand because of the yen problem has dropped by about 50 per cent. for most Japanese companies and we are effectively servicing those elements of the previously Japanese served market from the United Kingdom. We are in a position in which our programme is growing and their's is declining.

Dr Williams

717. Are you working then to capacity?

(Dr Maund) No, we still have considerable surplus capacity within the plant.

718. Which you hope to take out through the next year or so?

(Dr Maund) I would sincerely hope so. As Mr Bright has pointed out, whether it will ever come back to 1990 levels of demand worldwide before the end of the century I personally am in doubt.

719. Your success in the last year or so has been in Yamazaki's traditional market supplying that rather than the Japanese parent company supplying it?

(Dr Maund) Yes, indeed.

(Mr Bright) I was also responsible for establishing an American transplant here in the seventies and one of the big advantages is that against the volume in Japan the supply of componentry from Japan to the UK is extremely cost-effective and has been very cost-effective. When you put these very cost-effective componentry together with certain elements that are produced in the UK you can in fact produce a very cost-effective product, but you could not do that if you did not have the strong high volume producing parent and that is where UK companies find it very difficult because the large volume Japanese parent is operating in a market that only imports six per cent. The UK machine tool manufacture is operating in a market where we import 50 per cent. and so he does not have the ability to build the volume and, therefore, people like myself actually have during the eighties purchased componentry from suppliers of Yamazaki in Japan in order that we too can become quite cost-effective.

(Dr Maund) You are grateful for our existence afterall!

(Mr Bright) Absolutely. I have nothing but the greatest of possible respect for my Japanese competitors. I just wish they were not there!

(Dr Maund) Could I make one other point, Chairman? It is slightly relevant to both of these. We now find that the UK supply industry is more than competitive compared with the same product taken into our Japanese home plant. In other words, if I look into factory costs in Japan from Japanese selected suppliers and from UK suppliers, we are now more cost-effective and, in fact, I have got a team of five Japanese engineers with me at the moment who are actively examining components manufactured in the UK for export to Japanese made products to try and tackle the cost base there because of the yen problem primarily.

Mr Batiste

720. That actually is a very important area we wanted to ask about as well. We ascertained in Japan that the relationship between a company and its supplier was a very crucial one, that it was a very close one with suppliers being very much involved in the decision-making process in a company. We have also heard in evidence that in the UK the earliest of the transplants in the UK have begun to build up very similar relationships in respect of UK companies and have not had any difficulty given the amount of time necessary to set it up. It has obviously been a big advantage in a knock-on way in the motor car industry where there is now a range of companies that can supply the world with components. Is that same pattern now being established in machine tools for components?

(Dr Maund) From day one it was our intention to do that. We have a very close relationship with our suppliers in many instances on a single supplier basis. We have 540 suppliers at the moment; we are singled sourced on 107 of them and have been since the day we started to locate in the United Kingdom.

[**Mr Batiste** *Contd*]

721. What proportion in terms of added value in the final product is there now for UK based/UK supplied and how will it move?

(Dr Maund) The only import of significance we make from Japan at the moment is the control system, the electronics and the AXi motors and we are desperately at the moment trying to engineer our way out of that.

Chairman

722. Mr Bright, the question of suppliers and so on would you have any comment to make on that?

(Mr Bright) Yes, as I said there were certain suppliers that we sought in Japan. We did not seek control systems because there was a European system but it is impossible to source the UK control system because the manufacture is not there. Dr Bray spoke nostalgically about Ferranti. They started the CNC industry and they had the control system and that was the first CNC control system and then there was Plessey that came along but there is just no UK supplier and we must purchase from overseas and we do not have the advantage of the volume of the parent and the transplant and this is a disadvantage.

Chairman: Let us come now to a final question in relation to raising capital. Sir Trevor Skeet.

Sir Trevor Skeet

723. Dr Maund, how much access do you have to capital from your parent company?

(Dr Maund) We use none of the parent company's capital.

724. I see. You raise significant amounts of external finance?

(Dr Maund) Through private resources and the banks.

725. Overseas banks or local banks?

(Dr Maund) No, we have five banks at the moment, only two of which are Japanese and they have a minority of our loan debt. The rest of it is in Europe or the United Kingdom.

Dr Bray

726. Loans are secured against the assets of the parent company, are they not?

(Dr Maund) I presume so. I think initially it was underwritten by the parent company. I spend a lot of time trying to educate our customers on the uses of our technology and I am sure I am talking to the wrong audience. I should try and get their banks in and tell them what it is all about. They do not suffer like our customers from the reluctance of the finance industry to lend them money.

Sir Trevor Skeet

727. Mr Bright, I wonder whether I could tie this point up with you. Did you try the loan route on the market?

(Mr Bright) Yes we are a private company and as I said through to 1989 we were planning to become larger and perhaps even have a flotation in which case things would have been entirely different but we raise our finance through a UK bank and we have had no difficulty in raising the finance. We have had to pay the going rate of interest of course. I must say that when our banks have seen the way in which we are prepared to manage the business we have had one hundred per cent support. I am so pleased to say that I cannot report some of the difficulties that other people seem to be able to report and I am very grateful for it and I see it continuing in the future.

Chairman: Gentlemen, thank you very much. You have come here and you have answered our questions and you have also supplied substantial written evidence for which we are grateful. We thank you for your time and courtesy in coming this afternoon; we are much obliged.

Printed in the United Kingdom by HMSO at Hansard Press
Dd 0507570 12/93 C6 PS 1902560 PC 44083

HMSO publications are available from:

HMSO Publications Centre
(Mail, fax and telephone orders only)
PO Box 276, London SW8 5DT
Telephone orders 071-873 9090
General enquiries 071-873 0011
(queuing system in operation for both numbers)
Fax orders 071-873 8200

HMSO Bookshops
49 High Holborn, London, WC1V 6HB
071-873 0011 Fax 071-873 8200 (counter service only)
258 Broad Street, Birmingham, B1 2HE
021-643 3740 Fax 021-643 6510
33 Wine Street, Bristol, BS1 2BQ
0272 264306 Fax 0272 294515
9-21 Princess Street, Manchester, M60 8AS
061-834 7201 Fax 061-833 0634
16 Arthur Street, Belfast, BT1 4GD
0232 238451 Fax 0232 235401
71 Lothian Road, Edinburgh, EH3 9AZ
031-228 4181 Fax 031-229 2734

HMSO's Accredited Agents
(see Yellow Pages)

and through good booksellers

ISBN 0-10-024563-3

9 780100 245631